LonWorks

Integration Guide

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Overview

LonWorks Integration with the i-Vu Link

You can integrate LonWorks devices into an i-Vu CCN system with a i-Vu Link acting as a master device.

Carrier	
i-Vu Link	i-Vu Link
LonWorks port	S2
Module driver	drv_ivulink_lon_<latest version>.driver*
Read/write capability	Can read from and write to the third-party equipment
Third party points supported	500
Third party	
Supported equipment	Any device that supports the LonWorks protocol using SNVT's**
Network media type	EIA-232 to SLTA-10 network adapter
Quantity of devices you can physically connect to the i-Vu Link	1 LonWorks network segment with up to 64 LonWorks devices, daisy-chained

*The i-Vu Link driver supports LonWorks devices connected to Port S2 and BACnet or Modbus devices connected on the Ethernet port simultaneously. The third party point count for the i-Vu Link is the total of the 2 ports.

** UNVT's are proprietary and not supported.

Before-you-begin checklist

Assumptions

☐	You know how to create custom equipment in ApplicationBuilder.
☐	You know how to install, wire, set up, and download memory to the i-Vu Link.
☐	The LonWorks network/devices have been commissioned by the third-party representative using LonMaker.

Items to be installed at the job site

	Item	Notes
☐	i-Vu Link	
☐	LonWorks module driver	drv_ivulink_lon latest version>.driver.
☐	Echelon® SLTA-10 Serial LonTalk® Adapter • #73351 for FT-10 networks • #73352 for TP-78 networks • #73353 for TP-1250 networks • #73354 for RS-485 networks	You need 1 adapter for each i-Vu Link that is connected to a LonWorks network segment. Make sure you order the model that matches your network topology. See the *Echelon website* (http://www.echelon.com) for your local Echelon sales contact.
☐	Echelon® power supply (part# 78010)	**CAUTION!** You can damage the SLTA-10 if it does not have its own isolated power supply.
☐	EIA-232/RS-232 straight-through cable with 9-pin connectors and an S2-DB9 adapter (purchase S2-DB9 from Carrier) or 18-22 AWG, 4-conductor cable and a DB9 male adapter	To connect the i-Vu Link to its SLTA-10. You can buy an EIA-232/RS-232 cable with connectors or buy 4-conductor cable and wire your own connections.
☐	Custom equipment files and graphics	

Other items needed for the integration

	Item	Notes
☐	LonWorks Integration Tool	Install from the **Tools** CD.
☐	Network variable information (.xif file) for each type of LonWorks device. For example, VAV Controller or Fan Coil Controller.	Get from: • the third-party representative • www.lonmark.com • the LonWorks device. See Appendix B.
☐	Device address information (domain, index, subnet, and node address)	Get from: • the customer • the third-party representative • a .log file obtained from the LonWork's device. See Appendix B.
☐	Manual for each type of LonWorks device	Get from the third-party representative or the third-party website.

The integration process

Follow the steps in this document to integrate one or more third party LonWorks devices into an i-Vu CCN system using an i-Vu Link. To install and network the i-Vu Link, see the *i-Vu Link Installation and Start-up Guide*.

1 Create custom equipment in ApplicationBuilder

1. Start ApplicationBuilder.
2. Select equipment type:
   - **CCN Values Only** - to read and write values on the CCN network and to display those points on a graphic
   - **Integration Values Only -** to read and write values from the third party network and to display those points on a graphic
   - **CCN Link Integration -** to share values from the third party network with the i-Vu Link on the CCN network and to display those points on a graphic
3. Click **Next**.
4. Type a name for the custom equipment (i.e., Hot Water System).

   NOTE The name must not exceed 21 characters!
5. Enable **English** or **Metric** units.
6. Choose engineering options for your application (**Schedule and Setpoint, Runtime,** etc..**)**
7. Click **Next**.
8. Add **Elements** to your application.

   NOTE Elements are a collection of input/output points that perform a specific operation. The input/output point that is reading or writing to the LonWorks network is called an integration point. Integration points may be used in conjunction with CCN points to share data between the LonWorks network and the CCN network.

   The available **Elements** that you can add to your custom equipment in ApplicationBuilder are:

Point type	Used for
Read CCN Point	Reading an analog or binary value from the CCN network In: CCN Values, Link Integration
Carrier Text Point	Reading Text value from a CCN device In: CCN Values, Link Integration
Setpoint Write	Allows CCN setpoint value to be “edited” directly from graphic In: CCN Values, Link Integration

Point type	Used for
Link Integration Point to CCN Point	Reading an analog or binary value from the third party device and then writing that value to the CCN network In: Link Integration
Link CCN Passive Point to Integration Point	Exposing an analog or binary value to the CCN network so that it can be written to the third party network In: Link Integration
Read Integration Point	Reading an analog or binary value from the third party device In: Read Integration, Link Integration
Link CCN Point to Integration Point	Reading an analog or binary value from a CCN device and then writing it to the third party network In: Link Integration
Link Integration Point to CCN Passive Point	Reading an analog or binary value from the third party device and then exposing that value to the CCN network In: Link Integration
Link BACnet variable to CCN Point	Allows an analog or binary value from BACnet to write that value to the CCN network In: Link Integration

9 As you add **Elements**, enter the requested information for the integration or CCN points:

- **Display Text -** the name of the point as it will appear in i-Vu CCN (i.e., Frequency)
- **Reference Base -** the name that will be added to each point that makes up the Element, so that all points have a unique identifier (i.e.,input_Freq, trendFreq, output_Freq) - this name must be unique (do not copy and paste)
- **Input Address** - enter the LonWorks or CCN address

  Define the LonWorks or CCN address string using the syntax for each point in the list, as described below:

- **Input Scaling -** enter variables

  NOTE Use Scaling when the value you are reading from the LonWorks or CCN device needs to be scaled before showing the value on a graphic or trend. Scaling information can be found in the third party points list.

  Example: You have an integration point set up to read the motor temperature of a variable speed drive. The third party points list shows that this value will be given in degrees C, but you want to display it in degrees F on a graphic. Therefore, using the formula °F = 9/5(°C) + 32, the scaling/unit conversion fields for the integration point would be filled out as follows: ([value read] + 0) x 1.8 + 32

- **Output Address -** enter the LonWorks or CCN address, as described below.
- **Output Scaling -** enter variables

  Continuing the example above, if you wanted the graphic to display values in °F, but then you wanted to share that value with the CCN network in °C, the scaling for the CCN Passive Point would be:

  ([value read] + 0) x1 + 0

10 Click **Next.**

11 **Equipment Name** - type a new equipment name if desired.

12 **Save Location** - browse to a location where you would like to save the new custom equipment.

Click **Save**.

To format a LonWorks address

All Lonworks addresses should be assigned to "lonworks://" only when setting up address strings in ApplicationBuilder. The **LonWorks Integration Tool** is used to define these addresses.

To format a CCN address

There are three different methods for defining the CCN address strings.

1 They can be manually typed in **ApplicationBuilder**.

2 You can use **Copy table point** in i-Vu CCN's table interface to copy CCN point information directly from a CCN table to ApplicationBuilder's "ccn://" address field.

3 You can use **Map to Point** in i-Vu CCN's table interface to map the CCN points from your custom equipment file directly to CCN table data.

NOTE Your custom equipment must already be downloaded in the i-Vu Link to use this method. (Proceed to Assign and download custom equipment in i-Vu CCN first).

Method 1: Type the address manually in ApplicationBuilder

1 If you are actively reading or writing a point on a CCN device, then manually type in the CCN device's address, **Table Name**, and **Point Name** that you wish to read or write.

ccn://link/<Table Name>/<Point Name> ("link" indicates the CCN device that the custom equipment has been mapped to)

or

ccn://<bus, element>/<Table Name>/<Point Name>

Examples:

ccn://link/HWP01-32/TEMP

ccn://0,2/HWP01-32/TEMP

2 If the point is a CCN passive point (i.e, it's just being exposed to the CCN network), then type:

ccn://passive/<point name>, where <point name> is the name that you have chosen for this CCN point.

Example: ccn://passive/freq

Method 2: Copy table point in i-Vu CCN

1 Launch i-Vu CCN.

2 Select the desired equipment in the navigation tree.

3 Expand the tables underneath that equipment.

4 Find the specific table and point that you want to read or write.

5 Click **Copy** in the table interface.

6 Inside of **ApplicationBiuilder**, hit CTRL-V to copy the CCN address from the table to the "ccn://" address field.

Method 3: Map to point in i-Vu CCN

1 Launch i-Vu CCN.

2 Select the desired equipment in the navigation tree.

3 Expand the tables underneath that equipment.

4 Find the specific table and point that you want to read or write.

5 In the table interface, navigate to the **Map to Point** column.

6 From the drop-down menu, select the point in the custom equipment that should be mapped.

7 Click **OK**.

2 Assign and download the Lonworks driver

1 In the navigation tree, right-click on the i-Vu Link and select **Driver Properties**.

2 Right-click on the **Driver** node and select **Configure**.

3 In the **Driver Version** drop-down menu, select drv_ivulink_lon <latest version>.

4 Click **OK** and the driver will be automatically downloaded.

3 Assign and download custom equipment in i-Vu CCN

1. Open i-Vu CCN.
2. In the navigation tree, right-click the area where you want to place the custom equipment. Select **Add Equipment** from the drop-down menu.
3. Make the following entries:

Field	Notes
Display Name	Type an equipment name (i.e. ABB Drive).
Associate with	If your i-Vu Link is connected to CCN devices: ○ Enable CCN Device and fill in the bus and element number of the CCN device that this custom equipment will be linked to. **NOTE** This "association" is what allows you to use the term "link" in CCN address strings for this custom equipment rather than manually typing in the bus, element number into each CCN address string. If your i-Vu Open Link is NOT connected to CCN devices (only LonWorks devices): ○ Enable CCN Link and pick the i-Vu Link that is physically connected to the LonWorks network.
Equipment	Click **Add.** Browse to the .equipment file that was generated in ApplicationBuilder. Click **Continue**. When message appears "File uploaded successfully", click **Close**.

4. If you have already created a custom equipment graphic for this third party device in ViewBuilder, you can also add that graphic from this screen. Under **Views**, click **Add** and browse to your .view file. Click **Continue**. When message appears **File added successfully**, click **Close**. The custom equipment should now appear in the navigation tree.
5. Click **Exit Setup** and the custom equipment will be downloaded to the i-Vu Link.

4 Configure LonWorks points using LonWorks Integration tool

1. Log in to i-Vu CCN.
2. In the navigation tree, right-click on the custom equipment and click **Configure**.
3. Navigate to the **Integration Points** section at the bottom of the screen and click **Export**.

4 Click **Save**.

5 Browse to a location on your PC to save the file. (The file will have a .erl extension.)

6 Start the **LonWorks Integration Tool** (Lonworks_Integration_Tool.jar).

7 Click to start the wizard

8 Follow the wizard's instructions to create your LonWorks addresses.

9 Click to save the file to your PC. (The file will be saved with a .erl extension.)

10 Return to i-Vu CCN.

11 In the navigation tree, right-click on the custom equipment and click **Configure**.

12 Navigate to **Integration Points** at the bottom of the screen and click **Import**.

13 Browse to the .erl file that you saved in the LonWorks Integration Tool.

14 Click **Open** and then **Continue** to upload the file.

15 Click **Close**. The LonWorks addresses are now set.

To edit an integration or CCN point address

You can edit an integration or CCN point address in the following places:

- In ApplicationBuilder
- In i-Vu CCN on the custom equipment's **Properties** page > **Equipment** tab
- In i-Vu CCN on the custom equipment's **Properties** page> **Network Points** tab
- In the LonWorks Integration Tool

5 Connect an SLTA-10 to each i-Vu Link on the LonWorks network segment

CAUTION!
You will damage the SLTA-10 if it does not have its own isolated power supply. Do not share power with the i-Vu Link.

1 Turn off the i-Vu Link's power.

2 Remove power from the SLTA-10.

3 Set SLTA-10 DIP switches 1–8 as shown below. Switches 6–8 set the baud rate to 57600 for communications between the control module and the SLTA-10 .

4 Wire the i-Vu Link's Port **S2** to the SLTA-10's **EIA-232** port using one of the following methods:

- If you have an EIA-232/RS-232 straight-through cable with connectors and an S2-DB9 Adapter: Connect the adapter to the control module's port. Then connect one end of the cable to the adapter and the other end to the SLTA-10's **EIA-232** port.
- If you have an 18-22 AWG, 4-conductor cable and a DB9 male adapter: Wire one end of the cable to the control module's port and the other end to the adapter. See table below. Then connect the adapter to the SLTA-10's **EIA-232** port.

i-Vu Link's...	**...to DB9 adapter pin**
Tx	3
Rx	2
Signal Ground	5

5 Set the jumper for the control module's port to EIA-232.

6 Turn on the i-Vu Link's power.

7 Apply power to the SLTA-10.

6 Set up the driver properties

1 On i-Vu CCN's navigation tree, right-click on your custom equipment.

2 Select **Driver Properties.**

3 Expand **Protocols** and select **LonWorks.**

4 Select the i-Vu Link port S2 that connects to the SLTA-10.

5 In the **Baud** field, type 57600, the baud rate that you set on the SLTA-10 DIP switches.

6 Leave the default settings in the remaining fields under **Port Configuration** and the fields under **LonWorks Protocol Setup**.

7 Under **SLTA Domain Table**, select **Yes** in the **Define Domain Table** field.

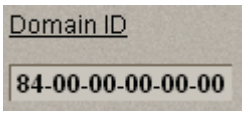
8 On the first line of the table (Index **0**), enter appropriate values in each field. See table below.

9 In Windows Notepad, open the .log file that NodeUtil created. To see this file in the Open dialog box, select **All Documents** in the **Files of type** field.

Field	**Notes**
Cloned	Select **No** for most applications.
Domain Length	Locate this number in the .log file. The Domain Length is in the **Size** field highlighted in the following example.

```
DEVICE:1> Device  (D)omain table
Enter domain table index  (0-1)  [all]     :
0Index  Size  Subnet  Node   Auth Key            Domn ID
0       1     1       3      FF FF FF FF FF FF   84
```

Field	Notes

Domain ID	Locate this number in the .log file. The Domain ID is 1 2-character segment, 3 segments, or 6 segments. In the following example, the highlighted Domain ID is 1 2-character segment.
	
	`DEVICE:1> Device (D)omain table`
	`Enter domain table index (0-1) [all] :`
	`0Index Size Subnet Node Auth Key Domn ID`
	`0 1 1 3 FF FF FF FF FF FF 84`
	
	In i-Vu CCN, type `-00 a`after the ID as many times as needed so that the **Domain ID** field has 6 2-character sections.
	
	 

Subnet ID	Locate this number in the .log file. The Subnet ID is highlighted in the following example.
	
	`DEVICE:1> Device (D)omain table`
	`Enter domain table index (0-1) [all] :`
	`0Index Size Subnet Node Auth Key Domn ID`
	`0 1 1 3 FF FF FF FF FF FF 84`

Node ID	In this field, you are giving the SLTA/Router or Link an ID number on the LonWorks network. Type any value in the range 1–127, but it **cannot** be the same as the Node ID of any LonLonWorks device on the LonLonWorks network. 99 is typically a good number to use.
Authentication Key	Do not change these values for most applications. i-Vu CCN uses this authentication code if the third-party device requests authentication.

10 Click the **Properties** button to refresh the page. Verify the following values in the **SLTA Node Status** section:

- **SLTA Comm Established**: Yes
  (SLTA-10 and Carrier controller are communicating.)
- **SLTA Node Online**: Yes
  (SLTA-10 and LonWorks network are communicating.)
- **SLTA Node Configured**: Yes
  (SLTA-10 has been commissioned.)
- **Address Domain**: (As displayed in the SLTA Domain Table)

11 On the navigation tree, select **Protocols**.

12 In the **Protocol Status** table, verify that the LonWorks protocol shows **Running** on port S2.

If the status shows **Not running** or the wrong port, verify port selection and DIP switch settings for that port on the control module.

7 Verify the control module is set up correctly

1 Verify that the latest custom equipment have been downloaded into i-Vu CCN.

2 On i-Vu CCN's navigation tree, select the custom equipment for the i-Vu Link.

3 On the **Properties** page, select the **Network Points** tab.

If...	Then...
You see the point value you expect with no errors in the **Error** column	You have successfully established communication with the third-party device.
A point shows question marks instead of values	i-Vu CCN is not communicating with the i-Vu Link. Troubleshoot communications. See the i-Vu Link's *Installation Guide*.
The point name is red	• Check for typos in the microblock address. • Increase the Transaction Timer on the LonWorks Properties page.
A value is incorrect	Verify that: • The **Address** in the integration point is correct. • The retrieved value is scaled properly, if necessary. For example, scaled from Celsius to Fahrenheit.Refer to the third-party manufacturer's documentation for scaling information.

If the above solutions do not resolve the problem, gather the following information for technical support:

- A diagnostic capture. See *To get a diagnostic capture* below.
- A screenshot of the **Driver Properties -** right-click on the custom equipment in the navigation tree**> select Driver Properties > Properties** page and the **LonWorks > Properties** page
- A screenshot of the custom equipment's **Properties** page > **Network Points** tab showing addresses and errors

To get a diagnostic capture

Use HyperTerminal, installed with Windows operating systems, to capture the communication between the i-Vu Link and the third-party device into a text file.

PREREQUISITES

- The i-Vu Link's IP address
- The longest integration point refresh time in the control program that has the error you are troubleshooting. In i-Vu CCN, view the control program's **Properties** page > **Network Points** tab to see all the refresh times.

1 Connect your computer's Ethernet port to the i-Vu Link's Ethernet port using one of the following:

   - A CAT5 or higher Ethernet crossover cable
   - A hub and a CAT5 or higher Ethernet straight-through cable

2 Ping the i-Vu Link to verify communications between the i-Vu Link and the computer you are using to get this capture.

3 On i-Vu CCN's navigation tree, right-click on custom equipment, select Driver Properties and then select **Protocols**.

4 Click **Properties**, select **Enable Telnet diagnostics**, then click **Accept**.

5 From the desktop, select **Start** > **Programs** > **Accessories** > **Communications** > **HyperTerminal**.

6 Type any name for your connection, then click **OK**.

7 In the **Connect using** field, select **TCP/IP (Winsock)**.

8 In the **Host address** field, type the IP address of the i-Vu Link, then click **OK**. Verify that **Login:>** appears in the window.

9 On the menu, select **File** > **Properties**. On the **Settings** tab, click **ASCII Setup**, select **Send line ends with line feeds** and **Echo typed characters locally**, then click **OK** twice.

10 Select **Transfer** > **Capture Text**, type the file path and name of the text file you are creating, then click **Start**.

11 Restart the i-Vu Link using the **restartmodule** manual command or the i-Vu Link's power switch.

12 After **Login:>**, type: `diagport` Click **Enter**.

13 To capture data receipts, after **diagport>:**

- Type: lonworks `rx`
- Type: lonworks `rx`

14 Verify the displayed text shows:

```
lonworks reporting level status:
      rx on
      tx on
      app off
      hi off
      ldv off
      off
      off
      off
```

If `rx or tx`, show "`off`", repeat step 14.

15 After **diagport>**, type: `go`

Click **Enter**.

16 Run the capture for one of the following periods of time:

- If all integration point refresh times are one minute or less, run the capture for 5 minutes.
- If any integration point refresh time is longer than 1 minute, run the capture for 5 times the longest microblock refresh time.

17 Type: `stop`
Click **Enter**. Verify that you see `diagport>` before doing the next step.

18 From the menu, select **Transfer** > **Capture Text** > **Stop**.

19 After **diagport>**, type: `logout`

Click **Enter.**

20 From the menu, select **File** > **Exit**. Save the connection if you want to use the connection later with the same settings.

21 In i-Vu CCN, clear the **Enable Telnet diagnostics** checkbox (see step 3 and 4), then click **Accept**.

22 Open the text file you defined in step 10, and verify that it legibly shows the same information that HyperTerminal displayed.

Appendix B - Common HVAC SNVT's

SNVT #	SNVT Name	Element #	Measurement	Value
39	SNVT_temp	0	°C	-274 — 6,279.5
83	SNVT_state	0		0 — 65,535 Each bit must be parsed out using control program logic.
84	SNVT_time_stamp	0	year	0 — 3,000
		1	month	1 — 12 = January — December 0 = month not specified
		2	day	1 — 31 0 = day not specified
		3	hour	0 — 23
		4	minute	0 — 59
		5	second	0 — 59
85	SNVT_zerospan	0	zero offset	-163.84% — 163.835%
		1	span multiplier	0 — 32.7675
87	SNVT_elapsed_tm	0	day	0 — 65,535
		1	hour	0 — 23
		2	minute	0 — 59
		3	second	0 — 59
		4	millisecond	0 — 999
88	SNVT_alarm	0 — 5	location	0 — 255 (decimal ASCII value) location of node number, description of characters used
		6	object ID (in node)	0 — 65,535

SNVT #	SNVT Name	Element #	Measurement	Value
		7	alarm type	-13 = Alarm header -12 = Alarm footer -11 = Alarm debug -10 = Alarm info -6 = Alarm system info -5 = Alarm value invalid -4 = Alarm constant -3 = Alarm offline -2 = Alarm unknown -1 = Value not available 0 = No alarm condition present 1 = Unspecified alarm condition present 2 = Total/service interval alarm 1 3 = Total/service interval alarm 2 4 = Total/service interval alarm 3 5 = Alarm low limit alarm clear 1 6 = Alarm low limit alarm clear 2 7 = Alarm high limit alarm clear 1 8 = Alarm high limit alarm clear 2 9 = Alarm low limit alarm 1 10 = Alarm low limit alarm 2 11 = Alarm high limit alarm 1 12 = Alarm high limit alarm 2 13 = Fire Alarm Condition 14 = Fire Pre-alarm condition 15 = Fire Trouble (fault) condition 16 = Fire Supervisory condition 17 = Fire Alarm condition in Test Mode 18 = Fire Pre-Alarm condition in Test Mode 19 = Fire Maximum environmental compensation level reached 20 = Fire Abnormal condition with an input object 21 = Fire Maintenance Alert 30 = Alarm fatal error 31 = Alarm error 32 = Alarm warning
		8	priority level	0 (lowest priority) — 3 (highest priority) LONMARK Fire products use the following: 4 = Life Safety Fire Alarms (BACnet Priority 2) 5 = Property Safety Fire Alarms (BACnet Priority 3) 6 = Fire Supervisory Alarm (BACnet Priority 4) 7 = Fire Trouble/Fault (Display) (BACnet Priority 5) 8 = Fire Pre-Alarm, HVAC Critical Equipment Alarm (BACnet Priority 6) 9 = HVAC Alarms (BACnet Priority 8) 10 = HVAC Critical Equipment RTN, Fire RTN (Display) (BACnet Priority 10) 11 = HVAC RTN (lowest priority) (BACnet Priority 16) -1 = Value not Available
		9	index of NV in alarm	0 — 65,535
		10 — 13	values of index	0 — 255, 0=not specified
		14	year	0 — 3,000, 0=not specified
		15	month	0 — 12, 0=not specified
		16	day	0 — 31, 0=not specified
		17	hour	0 — 23, 0=not specified

SNVT #	SNVT Name	Element #	Measurement	Value
		18	minute	0 — 59, 0=not specified
		18	second	0 — 59, 0=not specified
		20	millisecond	0 — 999, 0=not specified
		21 — 24	alarm_limit	0 — 255, 0=not specified
95	SNVT_switch	0	value	0 — 100%
		1	state	0 = off, 1 = on, –1 = undefined
103	SNVT_hvac_emerg	0	enumerated	0 = normal 1 = emergency pressurize 2 = emergency depressurize 3 = emergency purge 4 = emergency shutdown 5 = emergency fire
106	SNVT_temp_setpt	0	°C occupied cool	-273.17 — 327.66
		1	°C standby cool	-273.17 — 327.66
		2	°C unoccupied cool	-273.17 — 327.66
		3	°C occupied heat	-273.17 — 327.66
		4	°C standby heat	-273.17 — 327.66
		5	°C unoccupied heat	-273.17 — 327.66
108	SNVT_hvac_mode	0	enumerated	0 = auto 1 = heat 2 = morning warmup 3 = cool 4 = night purge 5 = pre cool 6 = off 7 = test 8 = emerg heat 9 = fan only 10 = free cooling 11 = ice 12 = max heat 13 = economy 14 = dehumidify 15 = calibrate 16 = emerg cool 17 = emerg steam 18 = max cool 19 = hvac load 20 = no load
109	SNVT_occupancy	0	status	0 = oc–occupied 1 = oc–unoccupied 2 = oc–bypass 3 = oc–standby oc–nul 0xFF

SNVT #	SNVT Name	Element #	Measurement	Value
111	SNVT_hvac_overid	0	state	0 = Not overridden -1 = Value not available The next 16 override values apply to all devices or groups. 1 = Override position percentage - use percent field 2 = Override flow in liters/sec - use flow field 3 = Override flow percentage - use percent field 4 = Override to position = 100% 5 = Override to position = 0% 6 = Override to configured minimum 7 = Override to configured maximum 8–16 = Unused The next 16 override values apply to the first device or group. 17 = Override position percentage - use percent field 18 = Override flow in liters/sec - use flow field 19 = Override flow percentage - use percent field 20 = Override to position = 100% 21 = Override to position = 0% 22 = Override to configured minimum 23 = Override to configured maximum 24–32 = Unused The next 16 override values apply to the second device or group. 33 = Override position percentage - use percent field 34 = Override flow in liters/sec - use flow field 35 = Override flow percentage - use percent field 36 = Override to position = 100% 37 = Override to position = 0% 38 = Override to configured minimum 39 = verride to configured maximum 40–48 = Unused
		1	Percent of full scale	-163.83 — 163.83%
		2	liters/second (flow)	0 — 65,534

SNVT #	SNVT Name	Element #	Measurement	Value
112	SNVT_hvac_status	0	mode	0 = Controller automatically changes between application modes 1 = Heating only 2 = Application-specific morning warm-up 3 = Cooling only 4 = Application-specific night purge 5 = Application-specific pre-cool 6 = Controller not controlling outputs 7 = Equipment being tested 8 = Emergency heat mode (heat pump) 9 = Air not conditioned, fan turned on 10 = Cooling with compressor not running 11 = Ice-making mode 12 = Max Heat 13 = Economy 14 = Dehumid 15 = Calibrate 16 = Emergency Cool 17 = Emergency Steam 18 = Max Cool 19 = HVC Load 20 = No Load -1 = Value not available
		1	% primary heat output	-163.84% — 163.83
		2	% secondary heat output	-163.84% — 163.83
		3	% cool output	-163.84% — 163.83
		4	% econ output	-163.84% — 163.83
		5	% fan output	-163.84% — 163.83
		6	% in alarm	0 — 255
113	SNVT_press_p	0	Pa(Pascal)	-32,768 — 32,768
127	SNVT_chlr_status	0	chiller run mode	0 = Overwrite this scene with new data 1 = Delete this scene from the list 2 = Display this sceneís data 3 = Report the number of programmed scenes 4 = Report the number of free scene storage spaces -1 = Value not available
		1	chiller operation mode	0 = Controller automatically changes modes 1 = Heating only 2 = Morning warm-up 3 = Cooling only 4 = Night purge 5 = Pre-cool 6 = Controller not controlling outputs 7 = Equipment being tested 8 = Emergency heat pump 9 = Air not conditioned, fan turned on 10 = Cooling with compressor not running 11 = Ice-making mode 12 = Max Heat 13 = Economy 14 = Dehumidify 15 = Calibrate 16 = Emergency Cool 17 = Emergency Steam 18 = Max Cool 19 = HVC Load 20 = No Load -1 = Value not available
		2	chiller state	1 = in alarm
		3		1 = run is enabled

SNVT #	SNVT Name	Element #	Measurement	Value
		4		1 = local
		5		1 = limited
		6		1 = chilled water flow
		7		1 = conditioned water flow
128	SNVT_tod_event	0	current scheduled occupancy state	0 = Area is occupied 1 = Area is unoccupied 2 = Area is temporarily occupied for the bypass period 3 = Area is temporarily unoccupied -1 = Value not available
		1	next scheduled occupancy state	0 = Area is occupied 1 = Area is unoccupied 2 = Area is temporarily occupied for the bypass period 3 = Area is temporarily unoccupied -1 = Value not available
		2	Minutes to next state	0 — 65,535
138	SNVT_Volt_ac	0	Volt	0 — 65,535
139	SNVT_amp_ac	0	Amp	0 — 65,535
145	SNVT_hvac_type	0	enumerated	0 = Generic 1 = Fan coil 2 = VAV Terminal 3 = Heat Pump 4 = Roof Top Unit 5 = Unit Ventilator 6 = Chilled ceiling 7 = Radiator 8 = Air Handling Unit 9 = Self-contained unit
153	SNVT_Enthalpy	0	J/Kg	-32,768 — 32,767

Appendix B - Obtain network, device, and network variable information

Use one of the following devices to temporarily connect a LAPTOP to the LonWorks network.

- *Option 1: Using an Echelon U10/U20 Network Interface* (page 20)
- *Option 2: Using an SLTA-10 Network Adapter* (page 21)
- *Option 3: Using an iLon™10 Ethernet Adapter* (page 23)

PREREQUISITES

- One of the above Echelon devices
- The location of each LonWorks device's service pin from the third-party representative.

  TIP For some VAV devices, the connected sensor's override button may also function as a service pin.

Option 1: Using an Echelon® U10/U20 USB Network Interface

To obtain and install Echelon software:

1. Go to www.echelon.com/support/downloads.
2. Log in or create a new login account.
3. In **Search for software in**, select **Network Interfaces**, click **Find**, then download **Open LDV** (latest version) **Network Drivers for Windows 2000/XP/2003**.
4. In **Search for software in**, select **Development Tools**, click **Find**, then download **NodeUtil Node Utility** (latest version).
5. Run the Open LDV .exe file to install the software.
6. Unzip the file that you downloaded for the NodeUtil Node Utility. Make note of this .exe file's location.
   EXAMPLE: `c:\Lon stuff`

To connect your computer to the LonWorks network:

7. Connect the Echelon U10/U20 USB Network Interface to your computer's USB port and to the LonWorks network segment.
8. On the computer, select **Start** > **Control Panel**.
9. Double-click **LonWorks Interfaces**.
10. Select the **USB** tab, then write down the **Network Interface Name**.
    EXAMPLE: LON2

To obtain the LonWorks device's .log file and .xif file:

11. Select **Start** > **All Programs** > **Accessories** > **Command Prompt**.
12. Type `cd "<path>"`, replacing `<path>` with the path where you unzipped NodeUtil (step 6 above), then press Enter.
    EXAMPLE: `cd "c:\Lon stuff"`
13. Type `nodeutil -d<name>`, replacing `<name>` with the Network Interface Name noted in step 10 above, then press Enter.
    EXAMPLE: `nodeutil -dLON2`

14. Type `O` (the letter, not zero).
15. Type a name for the file that NodeUtil will create with the LonWorks device's network variable information.
    EXAMPLE: `vav_controller.log`
16. Press Enter to create the file.
17. Push, then quickly release the service pin on the LonWorks device you want to get information from. The device number is displayed in the window.

    CAUTION Holding the service pin for 3 seconds or longer can delete memory from some third-party devices.

    TIP For some VAV devices, the connected sensor's override button may also function as a service pin.
18. Type `G` to go to the device menu.
19. Type the device number, then press Enter.

NodeUtil> Received an ID message from device 1.
Program ID is 80 00 CF 07 00 0A 04 05
NodeUtil> (G)o to device menu...
Node ID Neuron ID Program ID
0 04 32 5A D5 01 00 USBLTA *** network interface
1 04 7A E2 D1 01 00 80 00 CF 07 00 0A 04 05

20. Type `D`, then press Enter for [all] domain tables.
21. Type `X`, then wait for NodeUtil to request a file name.
22. Type a name for the .xif file that NodeUtil will create containing the device and network information. Omit the file extension; NodeUtil will automatically add the .xif extension.

    NOTE If you do not specify a path, the file will be saved in the same folder as the NodeUtil.exe file.
23. Press Enter to create the .xif file.
24. Type `E` to exit the device menu.
25. Close the Command Prompt window.

Option 2: Using an SLTA-10 Network Adapter

Your computer must have a serial port to use this option.

NOTE Echelon® software is incompatible with some USB to serial port adapters. If your computer does not have a serial port, use a different option to connect your computer to the LonWorks network.

To obtain and install Echelon software:

1. Go to www.echelon.com/support/downloads.
2. Log in or create a new login account.
3. In **Search for software in**, select **Network Interfaces**, click **Find**, then download
   - **Open LDV** (latest version) **Network Drivers for Windows 2000/XP/2003**
   - **LonWorks SLTA-10 Serial LonTalk(R) Adapter Software for Windows 98/2000/XP**

4. In **Search for software in**, select **Development Tools**, click **Find**, then download **NodeUtil Node Utility** (latest version).
5. Run the Open LDV .exe file to install the software.
6. Unzip the file that you downloaded for the LonWorks SLTA-10 Serial LonTalk(R) Adapter Software.
7. Run **slta10_Win.exe** to install the software. Make note of the **numeric base for the device name** number. Typically, this number is 1.
8. Unzip the file that you downloaded for the NodeUtil Node Utility. Make note of this .exe file's location.
   EXAMPLE: `c:\Lon stuff`

To connect your computer to the LonWorks network:

9. Remove power from the SLTA-10.
10. Set DIP switches 1, 4, 6, 7, and 8 in the up position.
11. Connect an EIA-232/RS232 straight-through cable to the SLTA-10 and to the computer's serial port. The SLTA must also be connected to the LonWorks network segment.
12. Reapply power to the SLTA-10.
13. On the computer, select **Start** > **All Programs** > **Echelon SLTA-10 Network Adapter** > **SLTALink Manager**.
14. Select **Link** > **Select/Action.**
15. Click **Edit**.
16. Select the **Update Identifier** checkbox.
17. Click **Next**.
18. In the **Serial Port** field, select the computer port that your EIA-232/RS232 straight-through cable is connected to.
19. In the **Speed** field, select 115200.
20. Click **Next** > **Finish** > **OK**.
21. Select **Link** > **Connect Now**.
22. Minimize the SLTALink Manager.

To obtain the LonWorks device's .log file and .xif file:

23. Select **Start** > **All Programs** > **Accessories** > **Command Prompt**.
24. Type `cd "<path>"`, replacing `<path>` with the path where you unzipped NodeUtil (step 8 above), then press Enter.
    EXAMPLE: `cd "c:\Lon stuff"`
25. Type `nodeutil -dlon<number>`, replacing `<number>` with the number you wrote down in step 7 above, then press Enter.
    EXAMPLE: `nodeutil -dLON1`
26. Type `O` (the letter, not zero).
27. Type a name for the file that NodeUtil will create with the LonWorks device's network variable information.
    EXAMPLE: `vav_controller.log`
28. Press Enter to create the file.

29. Push, then quickly release the service pin on the LonWorks device you want to get information from. The device number is displayed in the window.

    CAUTION Holding the service pin for 3 seconds or longer can delete memory from some third-party devices.

    TIP For some VAV devices, the connected sensor's override button may also function as a service pin.

30. Type `G` to go to the device menu.

31. Type the device number, then press Enter.

NodeUtil> Received an ID message from device 1.
Program ID is 80 00 CF 07 00 0A 04 05
NodeUtil> (G)o to device menu...
Node ID Neuron ID Program ID
0 04 32 5A D5 01 00 USBLTA *** network interface
1 04 7A E2 D1 01 00 80 00 CF 07 00 0A 04 05

32. Type `D`, then press Enter for [all] domain tables.

33. Type `X`, then wait for NodeUtil to request a file name.

34. Type a name for the .xif file that NodeUtil will create containing the device and network information. Omit the file extension; NodeUtil will automatically add the .xif extension.

    NOTE If you do not specify a path, the file will be saved in the same folder as the NodeUtil.exe file.

35. Press Enter to create the .xif file.

36. Type `E` to exit the device menu.

37. Close the Command Prompt window.

Close your connection

38 In the SLTA Link Manager, select **Link > Disconnect Now**, then close the window.

Option 3: Using an iLon10 Ethernet Adapter

To obtain and install Echelon software:

1. Go to www.echelon.com/support/downloads.
2. Log in or create a new login account.
3. In **Search for software in**, select **Network Interfaces**, click **Find**, then download **Open LDV** (latest version) **Network Drivers for Windows 2000/XP/2003**.
4. In **Search for software in**, select **Development Tools**, click **Find**, then download **NodeUtil Node Utility** (latest version).
5. Run the Open LDV .exe file to install the software.
6. Unzip the file that you downloaded for the NodeUtil Node Utility. Make note of this .exe file's location.
   EXAMPLE: `c:\Lon stuff`

To connect your computer to the LonWorks network:

7. Connect your computer to the iLon10 using a crossover cable alone or a straight-through cable with a hub. The iLon10 must also be connected to the LonWorks network segment.
8. On the computer, select **Start** > **Control Panel**.
9. Double-click **LonWorks Interfaces**.
10. Click **Add**.
11. Type a name such as `iLon10` and write down the name. You will use it later.
12. Click **Next** twice.
13. Type `1628` for the IP Port address of the iLon10.

    NOTE 1628 is the default port and is used for most installations. If your computer does not connect to the LonWorks network, ask the third-party representative if a different port was used.
14. Click **Finish**, then click **Close**.

To obtain the LonWorks device's .log file and .xif file:

15. Select **Start** > **All Programs** > **Accessories** > **Command Prompt**.
16. Type `cd "<path>"`, replacing `<path>` with the path where you unzipped NodeUtil (step 6 above), then press Enter.
    EXAMPLE: `cd "c:\Lon stuff"`
17. Type `nodeutil -dx.default.<name>`, replacing `<name>` with the name you typed in step 11 above, then press Enter.
    EXAMPLE: `nodeutil -dx.default.iLon10`
18. Type `O` (the letter, not zero).
19. Type a name for the file that NodeUtil will create with the LonWorks device's network variable information.
    EXAMPLE: `vav_controller.log`
20. Press Enter to create the file.
21. Push, then quickly release the service pin on the LonWorks device you want to get information from. The device number is displayed in the window.

    CAUTION Holding the service pin for 3 seconds or longer can delete memory from some third-party devices.

    TIP For some VAV devices, the connected sensor's override button may also function as a service pin.
22. Type `G` to go to the device menu.
23. Type the device number, then press Enter.

NodeUtil> Received an ID message from device 1.
Program ID is 80 00 CF 07 00 0A 04 05
NodeUtil> (G)o to device menu...
Node ID Neuron ID Program ID
0 04 32 5A D5 01 00 USBLIA *** network interface
1 04 7A E2 D1 01 00 80 00 CF 07 00 0A 04 05

24. Type `D`, then press Enter for [all] domain tables.
25. Type `X`, then wait for NodeUtil to request a file name.

26. Type a name for the .xif file that NodeUtil will create containing the device and network information. Omit the file extension; NodeUtil will automatically add the .xif extension.

    NOTE If you do not specify a path, the file will be saved in the same folder as the NodeUtil.exe file.

27. Press Enter to create the .xif file.
28. Type `E` to exit the device menu.
29. Close the Command Prompt window.

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